



U.S. DEPARTMENT OF
ENERGY

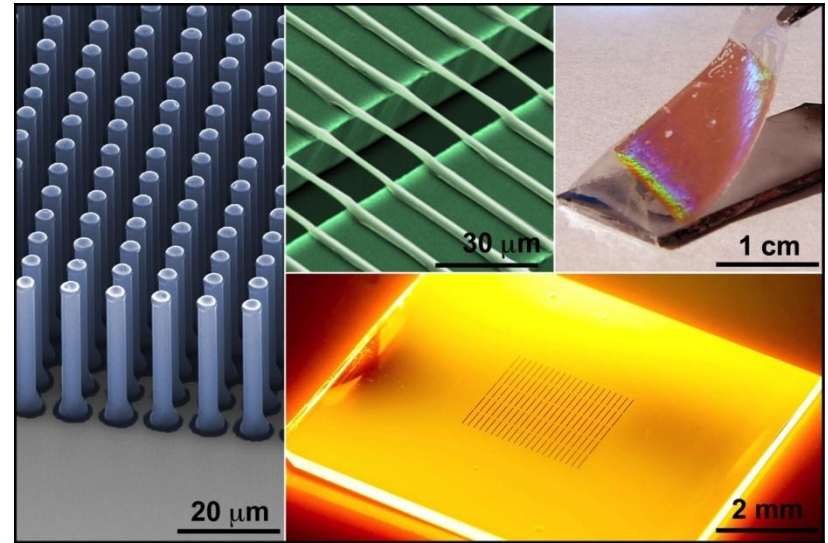
Office of
Science

Light-Material Interactions in Energy Conversion

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LMI EFRC: a national resource for fundamental optical principles and design for solar energy conversion.

Goal: to tailor the morphology, complex dielectric structure, and electronic properties of matter to sculpt the flow of sunlight, enabling light conversion to electrical and chemical energy with unprecedented efficiency.



RESEARCH PLAN AND DIRECTIONS

Challenge: Establish fundamental photonic principles for light absorption, propagation and emission in complex dielectric, plasmonic and metamaterial structures. **Approach:** Design and synthesize complex materials for increased solar absorption, optical frequency conversion, and spontaneous emission enhancement. **Outcome:** Photonic principles that have enabled record photovoltaic conversion efficiency.